Rishabh Singh, B.Eng.

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- Autonomous Vehicle Engineer with 4+ years of experience in Software Development and Automotive R&D along with End-to-End Development, Testing of Autonomous Car, Predictive Modeling and Data Analytics
- Vast experience in developing Advanced Driver Assistance Systems (ADAS) applications in C/C++, Python, R and Matlab/Simulink
- Experience of working on CAN protocol, deploying ADAS applications on to the real vehicle, verifying and validating the functionality of the software in real-time and capturing data logs for analysis
- Proficient in working on Computer Vision, Deep/Convolutional Neural Network Prediction Model, Visualization; mathematics, statistics, modeling and simulation
- Constantly rated as a top performer with vast experience of working with cross-functional and cross-cultural teams

SELECTED ACHIEVEMENTS

- Awarded with "Best Innovation Project" for developing a prototypic model of Self-Driving Car from the ground up at CTS
- "Employee of the Year" Award in Intelligent Product Services Department for the year 2017-2018 for working relentlessly for achieving the target

CORE SKILLS

- Python
- C/C++
- MATLAB/Simulink
- R
- Robot Operating System
- Machine Learning
- Git and Version Control
- Data Manipulation
- Data Visualisation

Tools & Technology: Jupyter Notebook, R Studio, Microsoft Visual Studio, ROS, Tableau, MS Excel, ETAS Busmaster, Vector CANoe, Vector CANlyzer, GIT, Tortoise SVN, Curtis Instrumentation, MS SQL, IPG CARMaker, VTD Vires, Windows, Linux

PROFESSIONAL EXPERIENCE

Associate
Sep 2014 – Jan 2019

Cognizant Technology Solutions, India

Project – Prototypic Development of Autonomous Vehicle

Experience Overview :

- Worked on developing a prototype of autonomous vehicle, algorithm development and its on-field track testing
- Worked on computer vision libraries for creating detection and recognition algorithms, developed software to control vehicle in real-time, used CAN protocol for communication and creation of data loggers for vehicle sensors
- Created Machine Learning model to predict steering angles and build different detection and recognition algorithms
- Working knowledge of Robot Operating System; different simulation platforms; autonomous vehicle sensors
- Created test plan, procedures and captured testing dataset for analysis in real time
- Researched different open source platforms and published research papers

Research Paper Publication

- Published a research paper in "FISITA Conference" on Validation of Autonomous Vehicle on Simulation Platform (ISSN: F2018/F2018-ACV-051) **Oct 2018**
- Published a research paper in "SIAT 2019" on Development of Autonomous Vehicle Controller (ISSN: SAE 2019-26-0098) **Jan 2019**
- Published a research paper in "International Journal of Advance Research in Computer Science and Management Studies" regarding use of virtual hard disk for recovering only corrupted blocks instead of entire file system (ISSN: 2321-7782 - Online) **Mar 2014**

Certificates: Udacity Data Scientists Nanodegree Program; Self-Driving Car - Applied Deep Learning; Deploy ML and NLP Models with Dockers(DevOps); Advanced Google Analytics

Engineering Intern
Sep 2013 – Apr 2014

CALSOFT, India

Project – Data recovery from hard disk in case of corrupted data

- Developed a Kernel level C program to retrieve information lost from a virtual hard disk using block-wise recovery technique; created an efficient method for accessing lost data by replacing only the corrupted blocks and files

EDUCATION

Bachelor of Engineering (Information Technology, MIT College of Engineering, India) **2010 - 2014**

- Major in Information Technology with focus on courses like Data Structures, Mathematics, Statistics and Visualization

Project Summary (Autonomous Vehicle)

Design, Implementation and Execution

- Worked on image processing algorithms with OpenCV library using Python for traffic sign detection and recognition, object detection model training using Convolutional Neural Network approach
- Developed path planning algorithm in C++, CAN protocol based controller for vehicle manoeuvring
- Designed and developed a desktop based interactive C++ tool for controlling the vehicle parameters in real-time
- Developed and validated an embedded C program to interface ultrasonic sensor breakout board with ECU of vehicle for detecting nearby objects and initiating emergency stop
- Worked on mapping and localization using GPS of centimetre level accuracy and IMU to find out the location of the vehicle in the map using MATLAB script
- Possess working knowledge of Robot Operating System (ROS framework) - node creation, communicating via messages, services & actions, writing CMakeLists and package file for navigating and controlling the vehicle
- Developed software tools to analyse sensor data captured through radars, lidar, stereo-cameras, and GPS
- Worked on virtual simulators like IPG Carmaker and VTD Vires for testing of autonomous vehicle
- Deployed Convolutional Neural Network for image classification models with ScikitLearn, Keras, Tensorflow using Flask with Docker containers on Apache server
- Worked on pattern recognition algorithms by eliminating irrelevant data points and using Principal Component Analysis and Histograms of Oriented Gradients, Support Vector Machines, K nearest neighbour and Bayes Decision rule to form the features for determining an object
- Used Behaviour Cloning with environment dataset to predict the steering angle of the vehicle at any given position of an arbitrary track
- Created test procedures to execute tests on road and in laboratory environments for driverless car
- Performed data analysis and slicing and dicing of high-volume data from different sources to highlight patterns, relationships and trends to solve real-world scenarios
- Analysed & reviewed sensor data to evaluate performance, failures and safety norms
- Created dashboards and reports of statistical analysis of large dataset

Research

- Researched different methods to handle and utilise lidar sensor dataset (point cloud) and open source platforms like Autoware and Apollo
- Researched different lane finding methods, developed lane & vehicle detection algorithm with Canny Edge Detection, Gray Scale Conversion, Hough Transformation, and Haar feature based classifier to reach maximum accuracy
- Researched and drew insights about different sensors used in self-driving cars, comparing their specifications aligning to the requirements

Nano degree – Data Scientist (Udacity Online Institute) **2018**

Project – Machine Learning – Creating Customer Segments

- Applied Unsupervised learning techniques on product spending data collected of a wholesale distributor to identify customer segments hidden in the data
- Pre-processed the data by scaling product category and then identified unwanted outliers; applied PCA transformations and implemented clustering algorithms to segment the transformed customer data
- Compared the segmentations and considered ways these information could help the wholesale distributor in future

Project – Machine Learning – Predicting Housing Prices

- Using Machine Learning concepts, found the best selling price for homes using a city dataset; built an optimal model based on statistical analysis; explored dataset and observed features, trained and tested the model
- Identified potential problems (e.g.: errors due to bias, variance) and applied techniques to improve the model (e.g.: cross validation and grid search)

Project – Data Science – Data Wrangling

- Using Python and its libraries Pandas, NumPy gathered data from twitter API and other sources, assessed its quality, tidiness, and cleaned the data by applying optimizing techniques; analysed and visualized the datasets